

SELF-ASSEMBLY OF PHENANTHRENE OLIGOMERS INTO NANOTUBES WITH LIGHT-HARVESTING PROPERTIES

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Abstract: Supramolecular polymerization enables the construction of highly organized chromophore arrays and thus is a method to build up artificial light-harvesting antennae.¹ In previous work we described the formation of a one-dimensional supramolecular polymer which absorbs light and effectively transfer the excitation energy to an acceptor.² Assembly of a two-dimensional light-harvesting antenna would increase the number of ordered chromophores for energy collection. In this poster we will present results for a 2,7-disubstituted phenanthrene oligomer which forms tubular structures in aqueous medium. Those assemblies are only weakly fluorescent but the addition of minute amounts of acceptor results in a strong increase of fluorescence. Figure 1 B) displays fluorescence intensities with and without incorporation of a pyrene-containing oligomer. Other aromatic compounds will be tested for their capability and efficiency to act as acceptor molecules.

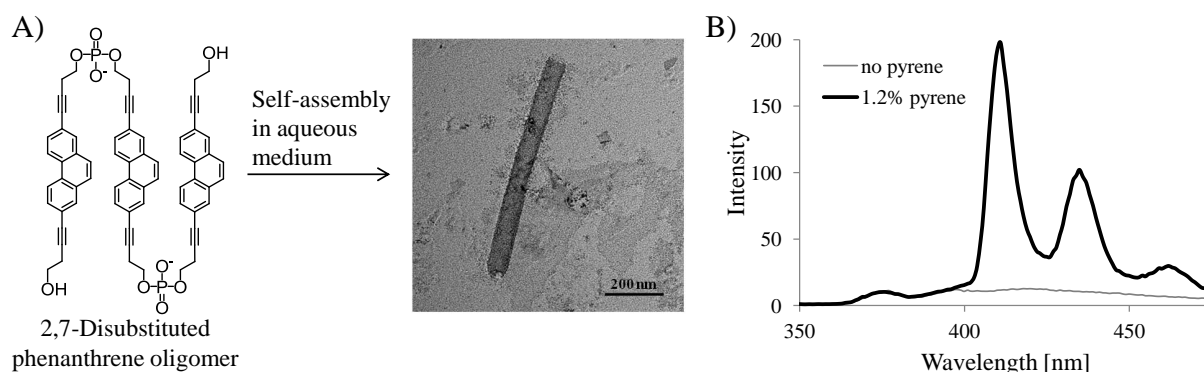


Figure 1: A) Chemical structure of 2,7-disubstituted phenanthrene oligomer and TEM image of supramolecular polymer. B) Fluorescence measurement of assembled phenanthrenes (grey) and in presence of 1.2% pyrene (black) upon excitation of phenanthrene.

1. Wasielewski M.R., Acc. Chem. Res. 42: 1910-1921, 2009.

2. Winiger C.B., Li S., Kumar G.R., Langenegger S.M., Häner R., Angew. Chem. Int. Ed. 53:13603-13613, 2014.